WHAT IS CLAIMED IS:

1. A single chip direct conversion transceiver, comprising:

a mixer unit including a first amplifier for amplifying signals received through an antenna, a mixer for eliminating carrier signals from signals output from the first amplifier using a predetermined input reference signal, a low pass filter for eliminating high frequency components from the signals output from the mixer, and a second amplifier for amplifying signals output from the low pass filter;

a local oscillator for providing the reference signal to the mixer;

a substrate on which the mixer unit and the local oscillator are provided as a circuit;

a positive hole formed between the mixer unit and the local oscillator in the substrate to a predetermined width and a predetermined depth and filled with a conductive plug for blocking signal leakage irradiated from the mixer unit and signal leakage irradiated from the local oscillator;

a shield ground surface formed above the substrate for blocking signal leakage occurring when the signals received through the antenna are input into the mixer and signal leakage occurring when the reference signal is input into the mixer from the local oscillator;

a first interconnection formed above the shield ground surface for connecting the mixer unit and the local oscillator;

a first dielectric layer formed between the substrate and the shield ground surface; and

a second dielectric layer formed on the shield ground surface to cover the first interconnection.

2. The transceiver of claim 1, wherein at least one passive element of the local oscillator and a second interconnection for connecting the at least one passive element are formed in the second dielectric layer above the shield ground surface.

3. The transceiver of claim 1, wherein a thickness of the shield ground surface is at least three times a skin depth of a total signal leakage.

4. The transceiver of claim 1, wherein the predetermined width of the positive hole is at least three times a skin depth of a total signal leakage.

5. The transceiver of claim 1, wherein the conductive plug is made of copper (Cu).

6. The transceiver of claim 1, wherein the positive hole is formed in the substrate by wet etching.

7. A method of manufacturing a single chip direct conversion transceiver, the method comprising:

forming a trench in a predetermined region of a substrate;

filling the trench with a conductive plug;

forming a mixer unit and a local oscillator on opposite sides of the trench in the substrate;

forming a first dielectric layer on the substrate;

forming a shield ground surface covering the first dielectric layer;

forming a second dielectric layer covering the shield ground surface;

forming first and second through holes in the first dielectric layer, the second dielectric layer, and the shield ground surface;

filling the first and the second through holes with first and second conductive plugs, respectively;

forming a first interconnection on the second dielectric layer for connecting the mixer unit and the local oscillator;

forming at least one dielectric layer covering the second dielectric layer;

forming a conductive layer between each of the second dielectric layer and the at least one dielectric layer; and

polishing a bottom surface of the substrate until the conductive plug is exposed, forming a positive hole.

8. The method of claim 7, wherein the trench is formed in the substrate by wet etching.

9. The method of claim 7, wherein the conductive plug is made of copper (Cu).

10. The method of claim 7, wherein the bottom surface of the substrate is polished using chemical mechanical polishing.

11. The method of claim 7, further comprising forming at least one passive element of the local oscillator and a second interconnection for connecting the at least one passive element in at least one of the second dielectric layer and the at least one dielectric later above the shield ground surface.

12. The method of claim 7, wherein a thickness of the shield ground surface is at least three times a skin depth of a total signal leakage.

13. The method of claim 7, wherein a width of the positive hole is at least three times a skin depth of a total signal leakage.